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### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**PATENT** 

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Application No.:

10/045,685

Filing Date:

November 7, 2001

Applicant:

Barker, et al.

Group Art Unit:

1745

Examiner:

To Be Assigned

Title:

ALKALI/TRANSITION METAL HALO- AND HYDROXY-

PHOSPHATES AND RELATED ELECTRODE ACTIVE

**MATERIALS** 

Attorney Docket:

4858-000213 CPC

Hon. Commissioner of Patents and Trademarks Washington, D.C. 20231

#### **INFORMATION DISCLOSURE STATEMENT**

Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicant hereby submits an Information Disclosure Statement for consideration by the Examiner.

## I. <u>LIST OF PATENTS, PUBLICATIONS, AND OTHER INFORMATION</u>

The patents, publications and other information submitted for consideration by the Office (except unpublished U.S. patent applications) are listed on Form 1449 attached hereto.

### II. COPIES

- A. X Submitted herewith is a legible copy of (i) each U.S. patent application publication and U.S. and foreign patent; (ii) each publication or that portion which caused it to be listed; (iii) for each cited pending U.S. application, the application specification including the claims, and any drawing of the application which caused it to be listed including the claims directed to that portion; and (iv) all other information or that portion which caused it to be listed.
- B. X Any patents, publications or other information which are listed on Form 1449 or on the copies of PTO-892, but which are not enclosed herewith, were previously cited by or submitted to the PTO in one of the following applications which has been relied upon for an earlier filing date under 35 U.S.C. § 120:

#### U.S. Serial Number

### U.S. Filing Date

09/559,861

April 27, 2000

C.\_\_\_\_This is a PCT application in the entry of the National Phase in the United States. A copy of the International Search Report is attached for the Examiner's information. The documents listed on the International Search Report are listed on the attached Form-1449 for consideration by the Examiner and for listing on any patent resulting from this application. Since the International Search Report was from the US, EPO, or JPO search authorities, copies of these references should have been supplied to the USPTO under the trilateral agreement and are believed to be in the file of the above-identified application. (MPEP 1893.03(g))

## III. CONCISE EXPLANATION OF THE RELEVANCE (check at least one box)

- A. X Except as may be indicated below in (B), all of the patents, publications or other information are in the English language (concise explanation not required).
- B.  $\underline{X}$  A concise explanation of the relevance of each patent, publication or other information listed that is not in the English language is as follows (see 37 C.F.R. § 1.98(a)(3)):
  - 1.\_\_\_\_See the attached foreign patent office communication from a counterpart foreign application:
  - 2. X English translations are provided for: JP 2001 085010; and EP1049182
  - 3. X\_Other: Abstracts of: JP 2001 052733; JP 09171827; JP 0625 1764;
- C. \_\_\_ The following additional information is provided for the Examiner's consideration.

## IV. CROSS REFERENCE TO RELATED APPLICATION(S)

A. \_\_\_ The Examiner is advised that the following co-pending application(s) contain(s) subject matter that may be related to the present application. By bringing this(these) application(s) to the Examiner's attention, Applicant(s) does(do) not waive the confidentiality provisions of 35 U.S.C. § 122.

Serial No.

Filing Date

Art Unit

## V. THIS IDS IS BEING FILED UNDER

A. X 37 C.F.R. § 1.97(b): (check <u>only</u> one box)

1.\_\_\_\_ within three months of the filing date of a national application other than a continued prosecution application under § 1.53(d) (37 C.F.R. § 1.97(b)(1)). No fee or certification is required.

2. \_\_\_\_ within three months of the date of entry of the national stage as set forth in §1.491 in an international application (37 C.F.R. § 1.97(b)(2)). No fee or certification is required. 3. X before the mailing of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)). No fee or certification is required. In the event that a first Office Action on the merits has been issued, please consider this IDS under 37 C.F.R. § 1.97(c) and see the certification under 37 C.F.R. § 1.97(e) below; or, if no certification has been made, charge our deposit account a fee in the amount of \$180.00 as required by 37 C.F.R. § 1.17(p). 4. \_\_\_\_ before the mailing of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No fee or certification is required. B. 37 C.F.R. § 1.97(c): (check only one box) before the mailing date of either any Final Office Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution. 1. \_\_\_\_ No certification; therefore, a fee in the amount of \$180.00 is required by 37 C.F.R. § 1.17(p). 2. \_\_\_\_ See the certification below. No fee is required. C. \_\_\_\_ 37 C.F.R. § 1.97(d): after the mailing date of either a Final Office Action under 37 C.F.R. § 1.113 or a Notice of Allowance under 37 C.F.R. § 1.311, vet on or before payment of the issue fee. 1. \_\_\_\_ See the certification below. A fee in the amount of \$180.00 is required by 37 C.F.R. § 1.17(p). <u>CERTIFICATION UNDER 37 C.F.R. § 1.97(e):</u> (check only one box) The undersigned hereby certifies that: A. \_\_\_each item of information contained in this IDS was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS (See 37 C.F.R. § 1.97(e)(1)). See further statement under 37 C.F. R. 1.704(d) below in section VII, if applicable; or

VI.

- B. \_\_\_\_ no item of information contained in this IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this IDS was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this IDS (See 37 C.F.R. § 1.97(e)(2)).
- C. \_\_\_Some of the items of information were first cited in a communication from a foreign patent office. As to this information, the undersigned hereby certifies that each item of information contained in this IDS was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS. As to the remaining information, the undersigned hereby certifies that no item of this remaining information contained in this IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this IDS was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this IDS.

#### VII. STATEMENT UNDER 37 CFR 1.704(d)

The undersigned hereby states that:

\_\_\_\_ each item of information contained in this IDS was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in 37 C.F.R. 1.56(c) more than thirty days prior to the filing of this IDS.

## VIII. PAYMENT OF FEES (check only one box)

- A. \_\_\_\_ A check in the amount of \$180.00 is enclosed for the above-identified fee.
- B.\_\_\_\_Please charge Deposit Account No. 22-0100 in the amount of \$180.00 for the above-indicated fee. A duplicate copy of this paper is attached.

The above references are being cited only in the interest of candor and without any admission that they constitute statutory prior art, contain matter which anticipates the invention, or which would render the same obvious, either singly or in combination, to a person of ordinary skill in the art. Furthermore, this Information Disclosure Statement shall not be construed as a representation that a search has been made.

If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule (with a petition if necessary) and charge the appropriate fee to Deposit Account No. 22-0100.

Please charge any additional fees or credit any overpayment pursuant to 37 C.F.R. § 1.16 or § 1.17 to Deposit Account No. 22-0100.

Respectfully submitted,

Dated: 31 + Jly 2002

David L. Suter Reg. No. 30,692

HARNESS, DICKEY & PIERCE, P.L.C. P.O. Box 828 Bloomfield Hills, Michigan 48303 (248) 641-1600

## FORM HDP-1449 (Based on Form PTO-1449)

PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE CITATIO

(Use several sheets if necessary)

Sheet 1 of 8

ATTORNEY DOCKET No. SERIAL NO. 4858-000213/CPC 10/045,685 APPLICANT J. Barker et al. FILING DATE **GROUP** 

November 7, 2001 1745

| Ref.<br>Desig. | Examiner's<br>Initials | Document<br>Number | Date     | Name                    | Class/<br>Subclass | (If appropriate)<br>Filing Date |
|----------------|------------------------|--------------------|----------|-------------------------|--------------------|---------------------------------|
| 1.             |                        | 3,736,184*         | 5/29/75  | Dey et al.              |                    | 1 ming Bate                     |
| 2.             |                        | 4,009,092*         | 2/22/77  | Taylor                  |                    | TE CT                           |
| 3.             |                        | 4,049,891*         | 9/20/77  | Hong et al.             |                    | RECEIVED                        |
| 4.             |                        | 4,098,687*         | 7/78     | Yang                    |                    | 10 CE                           |
| 5.             |                        | 4,194,062          | 3/18/80  | Carides et al.          |                    | VED<br>2019                     |
| 6.             |                        | 4,260,668*         | 4/7/81   | Lecerf et al.           |                    | 120                             |
| 7.             |                        | 4,434,216*         | 2/28/84  | Joshi et al.            |                    | 1700                            |
| 8.             |                        | 4,464,447          | 8/7/84   | Lazzari et al.          |                    |                                 |
| 9.             |                        | 4,477,541          | 10/16/84 | Fraioli                 |                    |                                 |
| 10.            |                        | 4,512,905*         | 4/23/85  | Clearfield et al.       |                    |                                 |
| 11.            |                        | 4,668,595          | 5/26/87  | Yoshino et al.          |                    |                                 |
| 12.            |                        | 4,683,181*         | 7/28/87  | Armand et al.           |                    |                                 |
| 13.            |                        | 4,690,877*         | 9/1/87   | Gabano et al.           |                    |                                 |
| 14.            |                        | 4,707,422*         | 11/17/87 | deNeufville et al.      |                    |                                 |
| 15.            |                        | 4,792,504          | 12/20/88 | Schwab et al.           |                    |                                 |
| 16.            |                        | 4,803,137*         | 2/7/89   | Miyazaki Tadaaki et al. |                    |                                 |
| 17.            |                        | 4,830,939          | 5/16/89  | Lee et al.              |                    |                                 |
| 18.            |                        | 4,925,752          | 5/15/90  | Fauteux et al.          |                    |                                 |
| 19.            |                        | 4,935,317          | 6/19/90  | Fauteux et al.          |                    |                                 |
| 20.            |                        | 4,985,317*         | 1/15/91  | Adachi et al.           |                    |                                 |
| 21.            |                        | 4,990,413          | 2/5/91   | Lee et al.              |                    |                                 |

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# PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE CITATION

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Sheet 2 of 8

| ATTORNEY DOCKET No. | SERIAL NO. |
|---------------------|------------|
| 4858-000213/CPC     | 10/045,685 |
| APPLICANT           |            |
| J. Barker et al.    |            |
| FILING DATE         | GROUP      |
| November 7, 2001    | 1745       |

| U.S. F         | PATENT DO              | CUMENTS            |          |                      | ·····              |                                 |
|----------------|------------------------|--------------------|----------|----------------------|--------------------|---------------------------------|
| Ref.<br>Desig. | Examiner's<br>Initials | Document<br>Number | Date     | Name                 | Class/<br>Subclass | (If appropriate)<br>Filing Date |
| 22.            |                        | 5,011,501          | 4/30/91  | Shackle et al.       |                    |                                 |
| 23.            |                        | 5,028,500          | 7/2/91   | Fong et al.          | 150                |                                 |
| 24.            |                        | 5,037,712          | 8/6/91   | Shackle et al.       |                    | R R                             |
| 25.            |                        | 5,130,211          | 7/14/92  | Wilkinson et al.     | C                  | RECEIVI                         |
| 26.            |                        | 5,232,794*         | 8/3/93   | Krumpelt et al.      |                    | 9                               |
| 27.            |                        | 5,262,253          | 11/16/93 | Golovin              |                    | BB                              |
| 28.            |                        | 5,262,548*         | 11/16/93 | Barone               |                    | 1100                            |
| 29.            |                        | 5,296,436*         | 3/22/94  | Bortinger            |                    | 5                               |
| 30.            |                        | 5,300,373          | 4/5/94   | Shackle              |                    |                                 |
| 31.            |                        | 5,326,653          | 7/5/94   | Chang                |                    |                                 |
| 32.            |                        | 5,399,447          | 3/21/95  | Chaloner-Gill et al. |                    |                                 |
| 33.            |                        | 5,411,820          | 5/2/95   | Chaloner-Gill et al. |                    |                                 |
| 34.            |                        | 5,418,090          | 5/23/95  | Koksbang et al.      |                    |                                 |
| 35.            |                        | 5,418,091          | 5/23/95  | Gozdz et al.         |                    |                                 |
| 36.            |                        | 5,435,054          | 7/25/95  | Tonder et al.        |                    |                                 |
| 37.            |                        | 5,456,000          | 10/10/95 | Gozdz et al.         |                    |                                 |
| 38.            |                        | 5,460,904          | 10/24/95 | Gozdz et al.         |                    |                                 |
| 39.            |                        | 5,463,179          | 10/31/95 | Chaloner-Gill et al. |                    |                                 |
| 40.            |                        | 5,482,795          | 1/9/96   | Chaloner-Gill        |                    |                                 |
| 41.            |                        | 5,508,130          | 4/16/96  | Golovin              |                    |                                 |

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# PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE CITATION

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| 4858-000213/CPC     | 10/045,685 |
| APPLICANT           |            |
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| FILING DATE         | GROUP      |
| November 7, 2001    | 1745       |

| Ú.S. F         | PATENT DO              | CUMENTS            | · · · · · · · · · · · · · · · · · · · |                   |                    |                                 |
|----------------|------------------------|--------------------|---------------------------------------|-------------------|--------------------|---------------------------------|
| Ref.<br>Desig. | Examiner's<br>Initials | Document<br>Number | Date                                  | Name              | Class/<br>Subclass | (If appropriate)<br>Filing Date |
| 42.            |                        | 5,514,490*         | 5/7/96                                | Chen et al.       | •                  | 4                               |
| 43.            |                        | 5,538,814          | 7/23/96                               | Kamauchi et al.   |                    | T                               |
| 44.            |                        | 5,540,741          | 7/30/96                               | Gozdz et al.      |                    | REOF                            |
| 45.            |                        | 5,541,020          | 7/30/96                               | Golovin et al.    |                    | 1-9<br>1-9                      |
| 46.            |                        | 5,620,810          | 4/15/97                               | Golovin et al.    |                    | RECEIVED                        |
| 47.            |                        | 5,643,695          | 7/1/97                                | Barker et al.     |                    | R 13                            |
| 48.            |                        | 5,660,948          | 8/26/97                               | Barker            |                    | 100                             |
| 49.            |                        | 5,695,893          | 12/9/97                               | Arai et al.       |                    |                                 |
| 50.            |                        | 5,700,298          | 12/23/97                              | Shi et al.        |                    |                                 |
| 51.            |                        | 5,712,059          | 1/27/98                               | Barker et al.     |                    |                                 |
| 52.            |                        | 5,804,335          | 9/8/98                                | Kamauchi et al.   |                    |                                 |
| 53.            |                        | 5,830,602          | 11/3/98                               | Barker et al.     |                    |                                 |
| 54.            |                        | 5,851,504          | 12/22/98                              | Barker et al.     |                    |                                 |
| 55.            |                        | 5,869,207          | 2/9/99                                | Saidi et al.      |                    |                                 |
| 56.            |                        | 5,871,866*         | 2/16/99                               | Barker et al.     |                    |                                 |
| 57.            |                        | 5,910,382*         | 6/8/99                                | Goodenough et al. |                    |                                 |
| 58.            |                        | 6,004,697          | 12/21/99                              | Thackeray et al.  |                    |                                 |
| 59.            |                        | 6,020,087          | 2/1/00                                | Gao               |                    |                                 |
| 60.            |                        | 6,103,419          | 8/15/00                               | Saidi et al.      |                    |                                 |
| 61.            |                        | 6,136,472          | 10/24/00                              | Barker et al.     |                    |                                 |

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| ATTORNEY DOCKET No. | SERIAL NO. |
|---------------------|------------|
| 4858-000213/CPC     | 10/045,685 |
| APPLICANT           |            |
| J. Barker et al.    |            |
| FILING DATE         | GROUP      |
| November 7, 2001    | 1745       |

| U.S. PATENT DOCUMENTS |                     |                    |          |               |                    |                                 |
|-----------------------|---------------------|--------------------|----------|---------------|--------------------|---------------------------------|
| Ref.<br>Desig.        | Examiner's Initials | Document<br>Number | Date     | Name          | Class/<br>Subclass | (If appropriate)<br>Filing Date |
| 62.                   |                     | 6,153,333          | 11/28/00 | Barker        |                    |                                 |
| 63.                   |                     | 6,183,718          | 2/6/01   | Barker et al. |                    |                                 |
| 64.                   |                     | 6,306,215          | 10/23/01 | Larkin        |                    |                                 |

<sup>\*</sup>Indicates submitted in parent case USSN 09/559,861 filed April 27, 2000.

| FORE           | FOREIGN PATENT DOCUMENTS |                                 |         |         |                    |                       |
|----------------|--------------------------|---------------------------------|---------|---------|--------------------|-----------------------|
| Ref.<br>Desig. | Examiner's<br>Initials   | Document<br>Number              | Date    | Country | Class/<br>Subclass | Translation<br>Yes No |
| 1.             |                          | JP 2001 085010                  | 3/30/01 | Japan   |                    | х                     |
| 2.             |                          | EP 1093172                      | 4/18/01 | EPO     |                    |                       |
| 3.             |                          | JP 2001 052733                  | 2/23/01 | Japan   |                    | Abstract              |
| 4.             |                          | WO 9930378<br>Corrected Version | 6/17/99 | WIPO    | Ħ                  |                       |
| 5.             |                          | WO 9930378<br>Original Version  | 6/17/99 | WIPO    | TECHROL            | - Z                   |
| 6.             |                          | WO 9812761                      | 3/26/98 | WIPO    | 7.00               | 5 C                   |
| 7.             |                          | WO 0001024                      | 1/6/00  | WIPO    | CEA                | 9 1                   |
| · 8.           |                          | EP 0 680 106 A1*                | 11/2/95 | EPO     | TER                | ED €                  |
| .9.            |                          | JP 61 263069*                   |         | Mizuno  | 170                |                       |
| 10.            |                          | WO 0057505*                     | 9/28/00 | WIPO    | 0                  |                       |
| 11.            |                          | EP 0 849 817*                   | 6/24/98 | EPO     |                    |                       |
| 12.            |                          | JP 09 171827*                   | 6/30/97 | Japan   |                    | Abstract              |

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Sheet 5 of 8

| ATTORNEY DOCKET No. | SERIAL NO. |  |
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| 4858-000213/CPC     | 10/045,685 |  |
| APPLICANT           |            |  |
| J. Barker et al.    |            |  |
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| November 7, 2001    | 1745       |  |

| FORE           | FOREIGN PATENT DOCUMENTS |                    |         |         | -                  |                      |    |
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| Ref.<br>Desig. | Examiner's Initials      | Document<br>Number | Date    | Country | Class/<br>Subclass | Translation<br>Yes N | ۷o |
| 13.            |                          | JP 0625 1764       | 9/9/94  | Japan   |                    | Abstract             |    |
| 14.            |                          | WO 00/31812        | 6/2/00  | WIPO    | ECH                |                      |    |
| 15.            |                          | WO 01/13443        | 2/22/01 | WIPO    |                    | 喜高                   |    |
| 16.            |                          | WO 01/54212        | 7/26/01 | WIPO    | 9                  |                      |    |
| 17.            |                          | WO 01/84655        | 11/8/01 | WIPO    |                    |                      |    |
| 18.            |                          | WO 01/53198        | 7/26/01 | WIPO    |                    | EB 13                |    |
| 19.            |                          | EP 1049182         | 11/2/00 | EPO     | H01M<br>4/58       | 78                   |    |

| OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.) |                     |   |
|--|---------------------|---|
| Ref.<br>Desig.   | Examiner's Initials |   |
| 1.   |                     | Andersson, A., et al., Thermal stability of LiFePO4 – based cathodes, (2000), Electrochem. Solid-State Lett., 3(2), pp. 66-68                   |
| 2.   |                     | Amine, K., et al., Olivine LiCoPO4 as 4.8 V Electrode Material for Lithium Batteries, (2000), Electrochem. Solid-State Lett., 3(4), pp. 178-179 |
| 3.   |                     | Kirkby, et al., Crystal Structure of Potassium Aluminum Fluoride Phosphate KA1FPO4, Zeits. Kristall. 956 (1995)                                 |
| 4.<br>   |                     | Nagornyi et al., Preparation and Structure of the New Fluoride Phosphate Na5CrF2(PO4)2, Russ. J. Inorg. Chem. 35, 470, (1990)                   |
| 5.   |                     | Arlt, et al., Na5AIF2(PO4)2: Darstellung, Kristallstruktur und Ionenleitfahigkeit, Z. anorg. Allg. Chem. 547, 179 (1987)                        |
| 6.   |                     | www.webmineral.com/data/Amblygonite.shtml   |
| 7.   |                     | www.webmineral.com/data/Lacroixite.shtml  |

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O E JOIGO BELLE TRACERO

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Sheet 6 of 8

| ATTORNEY DOCKET No. | SERIAL NO.       |  |  |
|---------------------|------------------|--|--|
| 4858-000213/CPC     | 10/045,685       |  |  |
| APPLICANT           |                  |  |  |
| J. Barker et al.    |                  |  |  |
| FILING DATE         | GROUP            |  |  |
| November 7, 2001    | per 7, 2001 1745 |  |  |

| OTHE           | R DOCUME               | NTS (including Author, Title, Date, Pertinent Pages, etc.)   |
|----------------|------------------------|--|
| Ref.<br>Desig. | Examiner's<br>Initials | www.webmineral.com/data/Montebrasite.shtml   |
| 8.             |                        | www.webmineral.com/data/Montebrasite.shtml   |
| 9.             |                        | www.webmineral.com/data/Montebrasite.shtml  www.webmineral.com/data/Tavorite.shtml  International Search Report for PCT/US97/15544.*   |
| 10.            |                        | International Search Report for PCT/US97/15544.*   |
| 11.            |                        | Rangan et al., "New Titanium-Vanadium Phosphates of Nasicon and Langbenite Structures, and Differences Between the Two Structions Toward Deintercalation of Alkali Metal, "JOURNAL OF SOLID STATE CHEMISTRY, 109, (1994) p 116-121.* |
| 12.            |                        | Delmas et al., "The Nasicon-Type Phosphates ATi2(PO4)3(A=Li, Na) as Electrode.  Materials, "SOLID STATE IONICS (1988) 28-30 pp 419-423*  |
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